CHEKMAREV, A.P., akademik; POBEGAYLO, G.G., inzh.

Rolling precision and the rigidity of rolling mill stands. Izv.vys.ucheb.zav.; chern.met. 2 no.8:69-74 Ag '59. (MIRA 13:4)

1. Institut chernoy metallurgii AN USSR. Rekomendovano kafedroy obrabotki metallov davleniyem Dnepropetrovskogo metallurgicheskogo instituta. 2. AN USSR (for Chekmarev).
(Rolling (Metalwork))

SOV/133-59-3-17/32

AUTHORS: ~~Chekmarev, A.P.~~, Academician, Ukrainian Academy of Sciences, Meleshko, V.I., Pavlov, V.L., Chekhranov, V.D., Candidates of Technical Sciences and Tsukanov, G.E., Shafran, I.K., Engineers, Ivanin, M.P., Senior Operator

TITLE: Rolling of Twin Ingots on a 1150 Blooming Mill (Prokatka sdvoyennykh slitkov na bluminge 1150)

PERIODICAL: Stal', 1959, Nr 3, pp 243 - 247 (USSR)

ABSTRACT: A rolling practice of rolling two ingots (in line one after the other) into blooms and slabs introduced at the Dzerzhinskiy Works at the end of 1957 is described. Changes in the roll passes made in 1958 are shown in Figures 1 and 2; characteristic dimensions and weights of rolled ingots - Table 1; rolling conditions during simultaneous rolling of two ingots into blooms - Table 2 and into slabs - Table 3. The operation of the mill under the above rolling conditions was investigated in co-operation with the Iron and Steel Institute of the Ac.Sc.Ukrainian SSR. Examples of the oscillographs obtained, indices of the loads and rolling velocities on rolling single and twin ingots are shown in Figures 4 and 5 and Tables 4 and 5, respectively. The experience of this type of rolling practice indicated that it is advantageous to apply it on all blooming mills as a

Card1/2

SOV/133-59-3-17/32

Rolling of Twin Ingots on a 1150 Blooming Mill

15-30% increase in the output (depending on the type of ingot and dimensions of blooms and slabs) can be obtained. This increase is mainly due to a decrease in the idling time. By maintaining correct rolling velocities the occurrence of shocks in the main mill line (when the grip of the second ingot takes place during the retardation of the motor) can be avoided. When introducing twin-ingot rolling in existing mills, it is necessary to introduce protective measures from overloading of asynchronous and rolling motors according to heating conditions. When designing new mills or reconstructing an existing mill, the possibility of rolling twin ingots should be taken into consideration. For this purpose, an increase in the power of motors and an increase in the length of the manipulator is necessary. There are 5 figures and 5 tables.

ASSOCIATIONS: Institut chernoy metallurgii AN USSR (Institute Ferrous Metallurgy, AS UkSSR) and zavod im. Dzerzhinskogo (im. Dzerzhinskiy Works)

Card 2/2

SOV/133-59-5-19/31

AUTHORS: Chekmarev, A.P., Academician of the Ac.Sc. Ukr.SSR, Dinnik, A.A., Grudev, A.P., Mut'yev, M.S., Spiridonov, N.P., Candidates of Technical Sciences and Vorotyntsev, Yu.V., Engineer

TITLE: On Maximum Angles of Bite During Rolling (O maksimal'nykh uglakh zakhvata pri prokatke) (I)

PERIODICAL: Stal', 1959, Nr 5, pp 444-445 (USSR)

ABSTRACT: These are remarks on the paper of B.P. Bakhtinov - "Utilisation of Reserve Friction Forces During Rolling on a Blooming Mill" (Stal', 1957, Nr 2) which was discussed during a conference on working of metals by pressure in Dnepropetrovsk. In the original paper, the author attempted to explain why the theoretical relationship $\alpha_e = 2\alpha_b$ (where α_e - maximum angle of bite during the steady state process of rolling, α_b - maximum angle of bite during the initial moment of feeding metal into rolls) is not confirmed by practice. The present authors point out that the work of the Rolling Section of the Academy of Sciences of the Ukrainian SSR established the deciding influence of scale on the coefficient of friction which led to the following conclusions: 1) Scale has little

Card 1/3

On Maximum Angles of Bite During Rolling SOV/133-59-5-19/31

influence on the initial conditions of bite as during the moment of feeding the metal into the rolls, the latter break off the scale from the edges of the specimen being fed into them, leaving clean metal.

2) The relatively small influence of scale on the friction coefficient and maximum angle of bite during slipping and stoppage of metal in rolls is also due to breaking off of scale from the contact surface of the rolls.

3) The scale reduces considerably (2 - 2.5 times) the coefficient of friction during the steady state rolling process, whereupon a wide field of instability of the process appears - from a bite angle below the friction angle (at $\alpha_b \approx 24^o$ and the ratio of $\alpha_e/\alpha_b \leqslant 1$) up to friction angles corresponding to complete slipping ($\alpha_b = 39-40°$).

4) On rolling specimens from which scale was removed, a sharp increase of the friction coefficient was observed, whereupon a stable rolling process is attained at an angle of bite $\alpha_e = 39-40°$ and a ratio $\alpha_e/\alpha_b \approx 1.7$.

Card 2/3

5) On rolling specimens for which no attempt was made to preserve or remove the scale, the ratio of the angles of bite varied within a wide range - from 1.5 to values below unity. Thus, the ratios of angles of bite obtained during rolling α_e/α_b = 1.25 - 1.35 (Ref 4) and occasionally below unity should be explained mainly by a decrease in the friction coefficient on transfer from the initial stage of bite to the steady state process induced by the scale or other causes. With preliminary removal of scale and forced feeding of metal into the rolls, a steady state progress can be obtained at large angles of bite. In conclusion it is stated that the corrections of Bakhtinov relating to the steady state conditions of rolling are incorrect.
There are 5 Soviet references.

S/137/60/000/010/011/040
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No. 10, p.113, # 23293

AUTHORS: Chekmarev, A.P., Prourzin, V.K.

TITLE: On the Problem of Determining the Value of Free Widening in Hot Rolling

PERIODICAL: Tr. Donetsk. industr. in-ta, 1959, Vol. 36, pp. 95-110

TEXT: Data obtained from the rolling of square cross-section low carbon steel samples, heated up to 1,150 and 900°C, were used for an analysis of formulae of widening given by various authors. Relative reduction $\Delta h/H$ varied within 8 - 70%. The graphical comparison of experimental and calculated functional dependences, at two variants of heating the metal to be rolled, makes it possible to evaluate the degree to which the changes in the friction conditions on the contact surfaces have been correctly taken into account in the formula analyzed.

G.G.

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

S/137/61/000/007/022/072
A060/A101

AUTHORS: Chekmarev, A. P.; Borisenko, G. P.

TITLE: Investigation of tension on a continuous section mill

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 7, 1961, 7, abstract 7D42 ("Tr. Konferentsii: Tekhn. progress v tekhnol. prokatn. proiz-va". Sverdlovsk. Metallurgizdat, 1960, 351-362)

TEXT: On the continuous light-section mill 250 with manual control of the main drive motors, the effect of tension upon the dimensional stability of the rolled profile was studied. The peculiarities of the technological process of rolling on this mill and the method of tension determination by means of a loop-holder of special design are described. The total pull in the strip between the stands of the planishing group of the mill is calculated from a formula relating it to the pull indication of the dynamometer, located in one of the arms of the loop-holder, and the constant of this mechanism. The measurement of tension between groups of the mill was carried out by means of a stationary tensometer pulley. The method of determining the mismatch in the velocity conditions of rolling is given. It is measured by the ratio of the possible input velocity

Card 1/2

of the metal into the stand next in the direction of motion to the velocity of metal output from the preceding stand. An industrial test has shown the great reliability and high precision of the proposed tensometers. The necessity of taking into account the effect of tension upon the quality of rolling is demonstrated. The arising of shrinkage in the strain seat, rather than between the stands of the mill, is experimentally verified. In rolling a circle of 20 mm diameter the magnitude of maximum admissible velocity mismatch amounts to 1.8 - 2.0 percent.

V. Mezis

[Abstracter's note: Complete translation]

S/148/60/000/006/003/010

AUTHORS: Chekmarev, A. P., Smol'yaninov, A. F.

TITLE: The Angle of Neutral Section in Rolling With Variable Roller Radius

PERIODICAL: Isvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgia, 1960, No. 6, pp. 77-87

TEXT: The authors investigated two cases of rolling, i. e., rolling with increasing and decreasing of the radius roller. The intermediate section of the roller is described by the equation of a logarithmic spiral. An analysis of equations derived is presented and the value of the maximum grip angle depending on the angle of roller tapering is given for rolling with increasing and decreasing roller radius. An analysis of equations is presented for the angles of neutral section in rolling with variable radius, depending on changes in the friction angle when ψ (tapering angle) is constant. The possible range of application of these equations is determined. The mean value of the coefficient of external friction can be experimentally determined by the method of intermediate sections in rolling with rollers of variable radius. There are 8 sets of graphs and 3 Soviet references. √B

ASSOCIATION: Dnepropetrovskiy metallurgicheskiy institut (Dnepropetrovsk Metallurgical Institute)

SUBMITTED: June 25, 1959.

Card 1/1

S/148/60/000/010/010/018
A161/A030

AUTHORS: Chekmarev, A.P.; Chernobrivenko, Yu.S.

TITLE: Forces Acting in the Edging of Hot Billets by Twist

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, 1960, No. 10, pp. 114 - 121

TEXT: In calculation attempts made so far (Refs. 3, 4) metal was assumed to be in an ideally plastic state, and the results were too inaccurate. A method is suggested for calculating the forces and moments forming in the usual edging (twisting) of hot rolled billets in a continuous billet, merchant and other mills taking into account the effect of temperature, speed and degree of deformation. The empirical curve $\tau - \gamma$ is approximated by a straight line (Fig. 1) and the vector of the tangential stress in any point of the cross section area in a twisted billet is presented by the formula: $\tau = k + \tau_{\pi} = k + \Pi\gamma$, (1) where k is the yield limit in shear (for the given temperature and speed of the deformation; τ_{π} - increase of yield limit on account of metal hardening; Π - the hardening module; γ - relative shift. The formula (1) is transformed into a differential joint equation expressed through the stress function F (x, y, k, θ):

Card 1/3

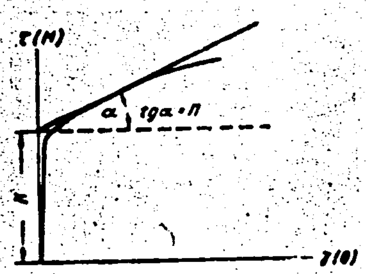
$$\frac{\partial^2 F}{\partial x^2}+\frac{\partial^2 F}{\partial y^2}=\frac{k}{\left[\left(\frac{\partial F}{\partial x}\right)^2+\left(\frac{\partial F}{\partial y}\right)^2\right]^{3/2}}\left[\frac{\partial^2 F}{\partial x^2}\left(\frac{\partial F}{\partial y}\right)^2-2\frac{\partial^2 F}{\partial x\partial y}\cdot\frac{\partial F}{\partial x}\cdot\frac{\partial F}{\partial y}+\frac{\partial^2 F}{\partial y^2}\left(\frac{\partial F}{\partial x}\right)^2\right]-2\pi\theta \quad (2)$$

where θ is the relative twist angle. In general form, the problem is reduced to finding the F (x, y, k, θ) function satisfying the equation (2) and turning into zero on the cross section outline of the billet. The moments are calculated for different sections - elliptical, square and rectangular - and by the moment formulae the forces applied to the twisted metal, and power expended for the twist. Formulae are evolved for determination of the relative twist angle, relative shift, relative deformation time, yield limit in shift, and hardening module. A practical calculation example is given for illustration: calculating the maximum forces and moments in retaining intake guides at edging of elliptical billet in a round pass of a "250" wire mill. The method provides more certainty in designing modern guiding devices. There are 3 figures and 7 Soviet references.

ASSOCIATION: Institut chernoy metallurgii AN USSR (Institute of Iron Metallurgy of the Academy of Sciences of the UkrSSR)

SUBMITTED: August 15, 1959

Figure 1: Empirical $\tau - \gamma$ relation approximated by straight line.



CH[redacted] [Chekmar'ov, O.P.]; akademik; CHERNOBRIVENKO, Yu.S. [Chornobryvenko, IU.S.]

Plastic torque in chamfering oval rods in a rolling mill. Dop.AN URSR no.11:1530-1533 '60. (MIRA 13:11)

1. Institut chernoy metallurgii AN USSR. 2. AN USSR (for Chekmarev). (Rolling (Metalwork)) (Torque)

S/137/61/000/006/032/092
A006/A101

AUTHORS: Chekmarev, A.P., Meleshko, V.I., Saf'yan, M.M.

TITLE: Experimental determination of the power and moments of rolling in the finishing group of a continuous thin-sheet 1680 mill

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 6, 1961, 3, abstract 6D18 ("Nauchn. Dnepropetr. metallurg. in-t", 1960, no. 30, 293-310)

TEXT: The authors present methods and results of determining the power and moments of rolling on the stands of a finishing group of a hot rolling 1680 mill. The data were obtained from oscillograms made with a 8-loop МПО-2 (MPO-2) oscillograph, recording the current intensity in the rotors of the drive motors, the voltage on the rotor terminals and the number of revolutions of the working rolls during rolling of the basic assortments of the mill. As a result of the investigation it was established that 1) by measuring the current intensity of the main motor drives, the tension of the strip between the stands of the finishing group can be established; 2) the magnitude of the moment of rolling can be determined from the oscillogram of currents, voltage and the number of revolutions by taking into account the tension; 3) the experimental data submitted

Card 1/2

make it possible to calculate the motor load when projecting rolling conditions for some carbon and alloyed steels on the investigated 1680 mill; 4) it follows from the analysis of experimental results that the distribution of load of the main drive motors assures, as a rule, maximum utilization of the metal ductility and correct outline of the strip; 5) rolling moments and, consequently, all the energy parameters of the new reduction conditions, can be calculated from experimental values of the coefficient of the arm of moment and specific pressure.

T. Davydov

[Abstracter's note: Complete translation]

S/137/61/000/006/026/092
A006/A101

AUTHORS: Chekmarev, A.P., Kapturov, L.Ye., Klimenko, P.L.

TITLE: Experimental investigation of the distribution of specific pressure over the contact surface during rolling on smooth rolls

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 6, 1961, 1 abstract 6D4 ("Nauchn. tr. Dnepropetr. metallurg. in-t", 1960, no. 39, 5 - 29)

TEXT: The authors substantiate a method selected for investigating specific pressures with the aid of a dynamometer functioning with a glued-on wire resistance pickup of a surface subjected to stretching. The investigations were made on a laboratory two-high mill with rolls of 260 mm diameter and 350 mm length. The experimental methods are described in detail. Pb-strips of 22, 16, 10, 6, 4 and 2 mm thickness, 50, 35 and 20 mm width, and 350 mm length each, were rolled, and it was established that: 1) specific pressures are non-uniformly distributed across the deformation seat; over its length they are highest in the center and least at the edges; 2) the absolute magnitude of specific deformation decreases with a reduced width of the strip; 3) during rolling of thick strips with a reduction of $\leq$ 23% tensile stresses arise which entail a decrease

Card 1/2

S/137/61/000/006/026/092
A006/A101

Experimental investigation ...

of specific pressure on the contact surface. To investigate the distribution of specific pressure during non-uniform deformation, special concave and convex Pb-specimens were rolled. It was found that compressive stresses increased the specific pressure in strip sections subjected to stronger compression and that tensile stresses reduced the specific pressure in less compressed sections of the strip.

V. Pospekhov

[Abstracter's note: Complete translation]

Card 2/2

S/137/61/000/006/034/092
A006/A101

AUTHORS: Chekmarev, A.P., Klimenko, P.L.

TITLE: Experimental investigation of the distribution of specific pressure on the contact surface in groove rolling

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 6, 1961, 4, abstract 6D26 ("Nauchn. tr. Dnepropetr. metallurg. in-t", 1960, no. 39, 30 -52)

TEXT: Investigations were made on a two high mill with 270 mm diameter rolls. The distribution of specific pressure on oval, round and square grooves was studied. Specific pressure was measured with the aid of special dynamometers with wire pickups. It was established that: 1) during rolling of square and rectangular blanks or of an oval blank on the flat side, least specific pressure occurred in the center and maximum pressure on the edges. During rolling of a round blank a reverse phenomenon was observed. 2) When rolling an oval blank in a round groove maximum specific pressure was observed in the center and least pressure on the edges; 3) During rolling in a square groove of a rhombic blank maximum specific pressure was observed at the vertex of the groove

Card 1/2

Experimental investigation ... S/137/61/000/006/034/092
A006/A101

and least pressure on the edges. A method is suggested for determining contact surfaces from the actual length of the grip arc with the aid of oscillograms of specific pressure. See RZhMet. 1961, 6D4.

V. Pospekhov

[Abstracter's note: Complete translation]

Card 2/2

S/137/61/000/007/041/072
A060/A101

AUTHORS: Chekmarev, A. P.; Rudoy, V. S.

TITLE: The contact surface and the separating force on rolls during pilger rolling

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 7, 1961, 36, abstract 7D288 ("Nauchn. Tr. Dnepropetr. metallurg. in-t.", 1960, no. 39, 53-72)

TEXT: A method is set forth and formulae are given for determining the dimensions of the instantaneous strain seat under pilger rolling. In the course of pilger rolling of pipes with diameter 219 - 325 mm the metal pressure upon the rolls was measured by a 500-ton wire dynamometer. An empirical formula is derived for determining the maximum values of the mean specific metal pressure upon the roll as a function of end temperature of the pilger rolling, the feed magnitude and thickness of the pipe wall. On the basis of this formula and a relationship for the area of the horizontal projection of the strain seat, the calculation of the total metal pressure upon the rolls is carried out.

V. Pospekhov

[Abstracter's note: Complete translation]

Card 1/1

S/137/61/000/006/031/092
A006/A101

AUTHORS: Chekmarev, A.P., Klimenko, V.M., Meleshko, V.I., Saf'yan, M.M., Chekhranov, V.D., Rabinovich, S.N.

TITLE: Pressure on rolls in rolling on a slab mill

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 6, 1961, 3, abstract 6D13 ("Nauchn. tr. Dnepropetr. metallurg. in-t", 1960, no. 39, 93 - 103)

TEXT: The authors describe methods and results of investigating the pressure of metal on horizontal and vertical rolls of a slab mill at the "Zaparozhstal'" Plant. The investigation was carried out in 1954. The pressure on the rolls was measured with the aid of dynamometers. The results and data obtained from the rolling of soft-grade and stainless steel slabs show, that the magnitudes of full pressure on the horizontal rolls are relatively uniformly distributed over the passes. Maximum pressure when rolling stainless steel is 1,350 - 1,450 tons, and 900 - 1,400 tons when rolling soft steels. The distribution of pressure over the passes on vertical rolls without resetting them, is non-uniform; pressure is considerably higher in even passes than in odd ones. In rolling

Card 1/2

S/137/61/000/006/031/092
A006/A101

Pressure on rolls in rolling on a slab mill

with resetting of vertical rolls, the distribution of pressure over the passes is relatively uniform. Maximum pressure is 300 - 350 tons on soft steels and 700 - 750 tons on stainless steels.

T. Davydov

[Abstracter's note: Complete translation]

Card 2/2

S/137/61/000/006/029/092
A006/A101

AUTHORS: Chekmarev, A.P., San'ko, N.M.

TITLE: Forward flow in groove rolling

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 6, 1961, 2, abstract 6D10 ("Nauchn. tr. Dnepropetr. metallurg. in-t", 1960, no. 39, 127-151)

TEXT: A method is presented of determining the forward flow during rolling in grooves. A formula is derived for the angle of neutral section with allowance for the effect of the lateral walls of the groove. The mean rolling radius is calculated for rectangular, square, rhombic, oval, and round grooves. The authors describe the design of a precision differential device for the recording of the forward flow on a tape. It is concluded that: 1) the experimental and calculated data are in a satisfactory agreement; 2) the neutral angle in respect to the bottom of the groove may, under certain conditions, be greater than the half or even the whole grip angle; 3) the forward flow in the grooves, in respect to the groove bottom, is always higher than the forward flow during rolling with smooth rolls.

[Abstracter's note: Complete translation] V. Pospekhov

Card 1/1

S/137/61/000/007/049/072
A060/A101

AUTHORS: Chekmarev, A. P.; Chepurko, M. I.

TITLE: Deformation of metal in pipe production

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 7, 1961, 37-38, abstract 7D300 ("Nauchn. tr. Dnepropetr. metallurg. in-ta", 1960, no. 39, 173-190)

TEXT: Methods are elaborated for determining the coefficient of partial (layer by layer) deformation for any element of the strain seat and the separation boundary of zones with different direction of radial deformation. For all kinds of pipe drawing equations are given for determining them. Curves of radial deformations in the strain seat are given. It is shown that the radial deformation of surface layers and the numerical values of the coefficients K_1 and K_2 of the changes ($K_1 = D_1/D_2 \mu$ [Abstracter's note: D_2 should read D_0, as it seems to be a misprint.] and $K_2 = d_1/d_0 \mu$, where D_0, d_0, D_1, and d_1 are respectively the outside and inside diameters of the pipe before and after the deformation, and μ is the elongation coefficient) make it possible to determine the pattern and the nonuniformity of radial deformation in the strain seat. It is shown that in

Card 1/2

the drawing of pipe through the draw-hole, whose cone generatrix represents a straight line, the axial deformation increases sharply from the beginning to the end of the strain seat, indicating the inefficiency of the draw-hole grooving. It is demonstrated that when the wall thickness of the pipe is retained or else increased or decreased only by little while it is being deformed in any manner, a two-valued radial deformation occurs. It is impossible to realize a plane deformation over the entire strain seat. The method of determining the partial (layer by layer) deformation in tube production may also be applied to deformation analysis in the production of other profiles, for example, in section rolling.

Yu. Manegin

[Abstracter's note: Complete translation]

S/137/61/000/007/040/072
A060/A101

AUTHORS: Chekmarev, A. P.; Finkel'shteyn, Ya. S.; Ludenskiy, I. M.

TITLE: Kinematics of the oblique rolling process

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 7, 1961, 36, abstract 7D287 ("Nauchn. tr. Dnepropetr. metallurg. in-t.", 1960, no. 39, 191-220)

TEXT: A new method of theoretical analysis of the process of oblique rolling is given, based upon the investigation of the directions of the friction forces on the contact surfaces and the conditions for equilibrium of forces acting in the strain seat in the axial and the tangential directions.

V. Pospekhov

[Abstracter's note: Complete translation]

Card 1/1

S/137/61/000/006/037/092
A006/A101

AUTHORS: Chekmarev, A.P., Grudev, A.P., Zhuk, V.G.

TITLE: Cold rolling of annealed cast iron sheets

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 6, 1961, 6, abstract 6D48 ("Nauchn. tr. Dnepropetr. metallurg. in-t", 1960, no. 39, 231-242)

TEXT: Information is given on results of cold rolling of annealed cast iron sheets. The value ζ serves as a basic characteristic of the deformation degree. Specimens of roofing cast iron sheets were rolled at from 0.1 to 53.5% per pass on a two high mill with rolls of 185 - 200 mm in diameter and 180 mm barrel length. Specimens with high reduction (relative widening up to 512%) were rolled on a four high mill with working rolls of 125 mm in diameter, backing rolls of 420 mm in diameter and 500 mm barrel length. As a result it was established that: 1) annealed cast iron sheets having the structure of ferrite wrought iron, are a sufficiently plastic material and can be rolled at room temperature; 2) when rolling cast iron sheets the mean specific pressure is

Card 1/2

higher than during rolling of carbon steel; 3) the use of greases (castor oil, machine oil and emulsion) reduces the metal pressure on the rolls.

V. Pospekhov

[Abstracter's note: Complete translation]

S/137/61/000/007/043/072
A060/A101

AUTHORS: Vatkin, Ya. L.; Kronfel'd, I. D.; Rozhnov, S. V.; Chekmarev, I.A.

TITLE: Investigation of the pressure on the rolls and the energy expenditure in the rolling of pipes in a continuous mill on a long mandrel

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 7, 1961, 37, abstract 7D294 ("Nauchn. tr. Dnepropetr. metallurg. in-t", 1960, no. 39, 252-277)

TEXT: The distribution of the metal pressure upon the rolls of mill stands for various types of groovings is investigated. As the pipe enters the following stands the pressure in the preceding ones is reduced. At steady state the pressures on the rolls in all the stands of the mill attain their minimum values but they are not equal to each other. The maximum pressure upon the rolls registered in the course of measurements was 72 tons while rolling pipes 59 x 37.5 of steel 15XM (15KhM) (III-rd stand). It was established that the pressure on the rolls increases with the decrease in pipe thickness and with the increase of the content of the alloy elements in the steel. A formula is derived for determining the specific pressure while rolling pipe on long mandrels and the pressure on the rolls while rolling 59 x 3.25 - 3.5 pipes of steel 10 is calculated. The

Card 1/2

comparison of calculated and experimental data indicates the practical applicability of the proposed formulae. The maximum values of energy expenditure for pipes with small wall thickness vary between the limits of 18 - 19 kwh/ton for various groovings.

Yu. Manegin

[Abstracter's note: Complete translation]

S/123/61/000/014/031/045
A004/A101

AUTHORS: Chekmarev, A.P., Meleshko, V.I., Saf'yan, M.M.

TITLE: Experimental determination of the power and moments of rolling in the finish train of the 1680 continuous sheet rolling mill

PERIODICAL: Referativnyy zhurnal. Mashinostroyeniye, no. 14, 1961, 21-22, abstract 14V133 ("Nauchn. tr. Dnepropetr. metallurg. in-t", 1960, no. 39, 293 - 310)

TEXT: The authors describe the method and the results of determining the power and moments in the stands of the finish train of the 1680 hot-rolling sheet mill, obtained by oscillographing, with the aid of an МПО-2 (MPO-2) eight-loop oscillograph, the current magnitude in the rotor of the driving electromotor, voltage on the rotor terminals, and the number of revolutions of the work rolls during the rolling by the mill of the main types and sizes. As a result of the investigations carried out it was found that: 1) by measuring the current magnitude of the main drive motors it is possible to establish the presence of strip tension between the stands of the finish train; 2) the magnitude of the rolling moment can be determined by an oscillogram of the currents, voltage and number of

Card 1/2

revolutions taking into account the tension; 3) the presented test data make it possible to obtain by calculation the motor loads during the planning of the rolling conditions for some carbon and alloyed steels on the investigated 1680 mill; 4) it follows from the analysis of the experimental data that the load distribution of the main drive motors ensures, as a rule, the maximum utilization of the metal ductility and the correct strip profile; 5) it is possible to calculate the rolling moments and, subsequently, all energy parameters of the new reduction conditions on the basis of the experimental values of the coefficient of the arm of the moment and specific pressure.

G. Davydov

[Abstracter's note: Complete translation]

22575
S/133/61/000/001/007/016
A054/A033

18.5100

AUTHORS: Chekmarev, A.P., Member of the Academy of Sciences USSR; Saf'yan, M.M., Candidate of Technical Sciences; Meleshko, V.M., Candidate of Technical Sciences; Soroko, L.N., Engineer; Kholodnyy, V.P., Engineer

TITLE: Heating the Finishing Stand Rolls of Wide Strip Mills

PERIODICAL: Stal', 1961, No. 1, pp. 43 - 46

TEXT: The frequent breakdowns of rolls in continuous and semi-continuous strip mills are a serious drawback for the increasing productivity of these machines. Breakdowns are mainly due to thermal stresses caused by the non-uniform heating of the rolls. Tests carried out to investigate this problem showed that the heat stresses depend largely on the degree of reduction, the temperature and the length of the strip and the speed of rolling. The thin surface layer of the rolls suddenly becomes heated to up to 102°C, when the strip enters and suddenly cools down when the strip leaves the roll. To eliminate the thermal stresses due to sudden temperature changes, the rate of rolling on the finishing stand in the Zavod Zaporozhstal' (Zaporozhstal' Plant) in the beginning of the working period

X

22575
S/133/61/000/001/007/016
A054/A033

Heating the Finishing Stand Rolls of Wide Strip Mills

is decreased, e.g., the 1,680 mm stand of this plant produces 200 tons in the first hour after the rolls have been changed instead of 400 tons. In order to prevent heat stresses in the rolls and thus to eliminate production losses, the present article suggests the rolls to be preheated before operation to the temperature which corresponds to the normal rolling temperature on the particular stand. For this purpose an inductor has been designed, composed of three coiled cores, two of which are mounted under the roll, the third above it. The inductor is a-c fed (50 cps, 380 v). The rolls, the ball bearings and supports are connected with this device. In the working rolls of the finishing stand holes were drilled in which thermocouples (three pairs per roll) were fitted. The test results are plotted in Figures 4, 5, 6 and 7, and it was established that six pairs of the continuous finishing stand rolls could be preheated effectively, according to the following scheme. Four h before they are mounted on the stand the rolls of stands VIII - IX, then the rolls of stand VI and VII and finally those of stand V and X should be preheated by the inductor described. The heated rolls have to be wrapped in flannel and stored on shelves, so that the temperature will be distributed in them evenly, before they are mounted on the stand. The time available is 3 h for the rolls of stand VIII - IX, 2 h for those of stand VI - VII and 1 h for the rolls of stand V. The rolls of stand X, whose working tem-

Heating the Finishing Stand Rolls of Wide Strip Mills

22575
S/133/61/000/001/007/016
A054/A033

perature is lower than that of the others, are heated only for 25 min and they are rolled over every 12 min. The temperature equalization takes 1.5 h in these rolls. By using a device for rotating the rolls slowly in the inductor, heating can be made more uniform. With preheated rolls mounted on the stand no special "heating up" period for the finishing stand process was necessary and the stands could operate at full capacity after the preheated rolls were mounted. There are 7 figures and 5 references: 1 Soviet and 4 non-Soviet.

ASSOCIATIONS: Institut chernoy metallurgii AN UkrSSR (Institute of Ferrous Metallurgy of the Academy of Sciences UkrSSR); Dnepropetrovskiy metallurgicheskiy institut (Dnepropetrovsk Metallurgical Institute); zavod "Zaporozhstal'" ("Zaporozhstal'" Plant)

Card 3/8

CHEKMAREV, A.P.; KLIMENKO, P.L.

Distribution of roll pressure and specific friction along the arc of contact during rolling. Izv. vys. ucheb. zav.; chern. met. no.2:68-76 '61. (MIRA 14:11)

1. Dnepropetrovskiy metallurgicheskiy institut.
(Rolling (Metalwork))

CHEKMAREV, A.P.; KLIMENKO, V.M.; TOPOROVSKIY, M.P.

Moments and power consumption in rolling with shaped grooves. Izv. vys.ucheb.zav.; chern.met. no.4:79-88 '61. (MIRA 14:4)

1. Institut chernoy metallurgii AN USSR.
(Rolling (Metalwork))

S/137/62/000/004/071/201
A052/A101

AUTHORS: Chekmarev, A. P., Rudoy, V. S., Chernyavskiy, A. A.

TITLE: Deformation seat parameters at hot pilger pipe rolling

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 4, 1962, 37, abstract 4D212 (V sb. "Proiz-vo trub". Khar'kov, Metallurgizdat, no. 5, 1961, 43-58)

TEXT: The available investigations of the deformation seat geometry are not sufficient for calculating optimum technological and energy conditions of the pilger mill operation. To determine the basic deformation seat parameters (angle of grip, entering height and length of deformation seat), an analytical and a graphoanalytical method are suggested. For both methods some assumptions are made. To check the suggested methods tests were carried out on a laboratory pilger mill; the results of the tests are given. The results of the investigations have shown that the angles of grip determined by both methods differ from the true values by 8 - 13%, and the contact areas by 5 - 8%.

A. Leont'yev

[Abstracter's note: Complete translation]

Card 1/1

CHEKMAREV, A.P., akademik; PROKOF'YEV, V.I., inzh.

Specific metal pressure on rolls during the hot rolling of steel considering the speed and degree of deformation. Trudy Inst. chern. met. AN URSR 15:3-11 '61. (MIRA 15:2)

1. Akademiya nauk USSR (for Chekmarev).
(Rolling (Metalwork))
(Deformations (Mechanics))

CHEKMAREV, A.P., akademik; PROKOF'YEV, V.I., inzh.

Speed of deformation during rolling. Trudy Inst. chern. met. AN URSR 15:12-15 '61. (MIRA 15:2)

1. Akademiya nauk USSR (for Chekmarev).
(Rolling (Metalwork))
(Deformations (Mechanics))

CHEKMAREV, A.P., akademik; TOKAREV, V.A., inzh.

Analysis of formulas for the determination of specific metal pressure on rolls. Trudy Inst. chern. met. AN URSR 15:16-45 '61. (MIRA 15:2)

1. Akademiya nauk USSR (for Chekmarev).
(Rolling (Metalwork))
(Pressure)

CHEKMAREV, A.P., akademik; KLIMENKO, V.M., kand.tekhn.nauk

Total and unit pressure in rolling with cut grooves. Trudy Inst. chern. met. AN URSR 15:83-108 '61. (MIRA 15:2)

1. Akademiya nauk USSR (for Chekmarev).
(Rolls (Iron mills))
(Deformations (Mechanics))

~~CHEKMAREV, A.P., akademik~~; KLIMENKO, V.M., kand.tekhn.nauk;
TOPOROVSKIY, M.P., inzh.

Investigating force factors in rolling with cut grooves.
Trudy Inst. chern. met. AN URSR 15:109-124 '61. (MIRA 15:2)

1. Akademiya nauk USSR (for Chekmarev).
(Rolling mills)

S/524/61/015/000/001/002
D217/D304

AUTHORS: Chekmarev, A.P., Academician of the AS UkrSSR, and Grechko, V.P., Candidate of Technical Science

TITLE: Investigating the parameters of continuous rolling under tension

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Institut chornoyi metalurhiyi. Trudy. v. 15. 1961. Prkatnoye proizvodstvo. no. 3, 125 - 136

TEXT: The experiments were carried out in the first two stands of the experimental three-stand continuous mill 180 of the Institut chernoy metallurgii AN USSR (Institute of Ferrous Metallurgy AS UkrSSR). The rolls of the first stand are vertical, and those of the second horizontal. The stands were individually powered and the speed of revolution could be regulated. The mill was provided with electric measuring instruments for measuring pressure exerted by the metal on the rolls, torque, tension and support of

Card 1/2

S/524/61/015/000/001/002
D217/D304

Investigating the parameters ...

the strip. The experimental dependences of roll pressure and of the torque on the tension in the strip under conditions of rolling in plain rolls, were obtained. The influence of tension in the strip, on the components of the resultant force was studied. It was found that under conditions of tension the direction of the resultant force influences the change of the components more effectively than the displacement of the resultant. The graphs given in the article can be applied in connection with rolling in plain rolls in the investigated range of tension, if the ratio between length of grip arc and average strip length used in the experiments is employed. There are 12 figures and 1 table.

Card 2/2

S/524/61/015/000/002/002
D217/D304

AUTHORS: Chekmarev, A.P., Academician of the AS UkrSSR, and
Grechko, V.P., Candidate of Technical Sciences

TITLE: Influence of tension on the pressure exerted by the metal on the rolls in the rolling of strip

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Instytut chornoyi metaluriyi. Trudy. v. 15, 1961, Prokatnoye proizvodstvo. no. 3, 137 - 143

TEXT: The experiments were carried out in the first two stands of the continuous three-stand mill 180 of the Institut chernoy metallurgii AN USSR (Institute of Ferrous Metallurgy AS UkrSSR). The position of the rolls in the first stand was vertical, and in the second, horizontal. The stands were individually powered and the speed of revolution could be regulated. The mill was provided with electric measuring instruments for measuring pressure exerted by the metal on the rolls, of the tension and support of the strip. Billets were heat-

Card 1/2

ed in a gas-fired kiln. The rolling temperature was maintained at 1100°C and was measured by means of an optical pyrometer. Tension was induced in the strip by changing the speeds of revolution of the rolls in the separate stands. The roll speeds were maintained between 0.1 and 0.15 m/sec.. The roll diameter in the first stand was 160 mm, and in the second stand 174 mm. It was found that a slight reduction of the pressure exerted by the metal against the rolls (2 - 10 % under the experimental conditions) occurs under conditions of tension, essentially as the result of a decrease of specific pressure. The lateral spread also decreases. The values (experimental and calculated) for the mean specific pressure coincide closely with each other, which enables A.I. Tselikov's formula for calculating mean specific pressures to be applied under conditions close to those used in the author's experiments. On increasing the tension (front rear) the elongation of the strip increases, mainly as a result of the decrease in lateral spread. There are 3 figures, 3 tables and 1 Soviet-bloc reference.

CHEKMAREV, A.P., akademik; MELESHKO, V.I., kand.tekhn.nauk; PAVLOV, V.L., kand.tekhn.nauk; CHEKHRANOV, V.D., kand.tekhn.nauk; KARPUNIN, A.M., inzh.; CHEPELEV, P.M., inzh.

New roughing conditions on 950 blooming mills. Trudy Inst. chern. met. AN URSR 15:189-199 '61. (MIRA 15:2)

1. Akademiya nauk USSR (for Chekmarev).
(Rolling mills)

CHEKMAREV, A.P.; KLIMENKO, V.M.

Metal pressure on the lateral faces of shaped grooves. Izv.vys. ucheb.zav.; chern.met. 4 no.9:95-103 '61. (MIRA 14:10)

1. Dnepropetrovskiy metallurgicheskiy institut i Institut chernoy metallurgii Akademii nauk USSR.
(Rolls (Iron mills))

CHEKMAREV, A.P.; KLIMENKO, V.M.

Experimental investigation of the distribution of unit pressures during rolling in shaped grooves. Izv. vys. ucheb. zav.; chern. met. 4 no.12:72-82 '61. (MIRA 15:1)

1. Dnepropetrovskiy metallurgicheskiy institut i Institut chernoy metallurgii AN USSR.

(Rolling (Metalwork))

CHEKMAREV, ~~Aleksandr Petrovich~~, kand.tekhn.nauk; VATKIN, Yakov Leybovich; NOSAL', V.V., red.; VLADIMIROV, Yu.V., red. izd-va; ATTOPOVICH, M.K., tekhn. red.

[Principles of pipe rolling in round grooves] Osnovy prokatki trub v kruglykh kalibrakh. Moskva, Metallurgizdat, 1962. 221 p. (MIRA 15:7)

(Pipe mills)

CHEKMAREV, A.P., akademik, nauchnyy red.; GOROBINCHENKO, V.M., red. izd-va; DOBUZHINSKAYA, L.V., tekhn. red.

[Theory of rolling; materials] Teoriia prokatki; materialy. Moskva, Metallurgizdat, 1962. 739 p. (MIRA 15:7)

1. Konferentsiya po teoreticheskim voprosam prokatki, Dnepropetrovsk, 1960. 2. Akademiya nauk USSR (for Chekmarev).
(Rolling (Metalwork))

CHEKMAREV, A.P., akademik; KUTSOV, Yu.G., inzh.

Rolling beams and channels from butt welded blanks. Met. i gornorud. prom. no.6:22-26 N-D '62. (MIRA 17:8)

1. Institut chernoy metallurgii Gosudarstvennogo komiteta Soveta Ministrov SSSR po chernoy i tsvetnoy metallurgii.
2. AN UkrSSR (for Chekmarev).

CHEKMAREV, A.P., akademik; TOPOROVSKIY, M.P., inzh.

Certain dependences of transition processes during continuous cold rolling. Trudy Inst. chern. met. AN URSR 17:3-15 '62. (MIRA 15:10)

1. Akademiya nauk UkrSSR.
(Rolling (Metalwork))

CHEKMAREV, A.P., akademik; PROKOF'YEV, V.I., inzh.

Analytic determination of specific pressures during the hot rolling of steel. Trudy Inst. chern. met. AN URSR 17:55-66 '62. (MIRA 15:10)

1. Akademiya nauk UkrSSR (for Chekmarev).
(Rolling (Metalwork)) (Deformations (Mechanics))

CHEKMAREV, A.P., akademik; KACHAYLOV, A.P., inzh.

Determination of actual yield points in steel by hot torsion. Trudy Inst. chern. met. AN URSR 17:83-98 '62. (MIRA 15:10)

1. Akademiya nauk UkrSSR (for Chekmarev).
(Steel—Testing) (Deformations (Mechanics))

CHEKMAREV, A.P., akademik; TERYAYEV, V.A., kand.tekhn.nauk

Boundary condition for rolling in flange grooves. Trudy Inst. chern. met. AN URSR 17:113-124 '62. (MIRA 15:10)

1. Akademiya nauk UkrSSR (for Chekmarev).
(Rolling (Metalwork))

CHEKMAREV, A.P., akademik; POBEGAYLO, G.G., inzh.

Calculation of roll grooving on prestressed stands. Trudy Inst. chern. met. AN URSR 17:135-141 '62. (MIRA 15:10)

1. Akademiya nauk UkrSSR.
(Rolls (Iron mills))

CHEKMAREV, A. P., akademik; POBEGAYLO, G. G., inzh.

Increasing the accuracy of rolling on shape and wire mills.
Nauch. trudy DMI no.48:5-54 '62. (MIRA 15:10)

1. Akademiya nauk Ukrainskoy SSR (for Chekmarev).

(Rolling(Metalwork))

CHEKMAREV, A. P., akademik; OSTAPENKO, V. V., inzh.; BORISENKO, G. P., inzh.; GETMANETS, V. V., inzh.; LEVCHENKO, L. N., inzh.

Rolling of angle steel on a continuous mill. Nauch. trudy DMI no.48:79-93 '62. (MIRA 15:10)

1. Akademiya nauk Ukrainskoy SSR (for Chekmarev).

(Rolling(Metalwork))

CHEKMAREV, A. P., akademik; BORISENKO, G. P., inzh.

Forward slip in rolling angles on continuous mills. Nauch. trudy DMI no.48:94-107 '62. (MIRA 15:10)

1. Akademiya nauk Ukrainskoy SSR (for Chekmarev)

(Rolling(Metalwork))

CHEKMAREV, A. P., akademik; BORISENKO, G. P., inzh.

Investigating tension on a continuous shape mill. Nauch. trudy DMI no.48:108-120 '62. (MIRA 15:10)

1. Akademiya nauk Ukrainskoy SSR (for Chekmarev).

(Rolling mills)

CHEKMAREV, A. P., akademik; MELESHKO, V. I., kand. tekhn. nauk; SAF'YAN, M. M., kand. tekhn. nauk; KHOLODNYY, V. P., inzh.

Temperature conditions of roughing rolls on continuous thin-sheet mills. Nauch. trudy DMI no.48:121-131 '62. (MIRA 15:10)

1. Akademiya nauk Ukrainskoy SSR (for Chekmarev).

(Rolls(Iron mills)) (Thermal stresses)

CHEKMAREV, A. P., akademik; SMOL'YANINOV, A. F., kand. tekhn. nauk; KLIMENKO, P. L., kand. tekhn. nauk; MALYY, Yu. G., inzh.

Pressure in rolling between rolls with a variable radius. Nauch. trudy DMI no.48:167-173 '62. (MIRA 15:10)

1. Akademiya nauk Ukrainskoy SSR (for Chekmarev).

(Rolling(Metalwork))

CHEKMAREV, A. P., akademik; KAPTUROV, L. Ye., inzh.; RABINOVICH, S. N., inzh.

Metal pressure on rolls and cogging conditions on a three-high sheet rolling mill in the Novo-Kramatorsk machinery plant. Nauch. trudy DMI no.48:239-249 '62. (MIRA 15:10)

1. Akademiya nauk Ukrainskoy SSR (for Chekmarev).

(Kramatorsk—Machinery industry)
(Rolling(Metalwork))

CHEKMAREV, A. P., akademik; RABINOVICH, S. N., inzh.; KAPTUROV, L. Ye., inzh.

Investigating the grooving and the wear of rolls on a two-high thin sheet rolling mill. Nauch. trudy DMI no.48:250-256 '62. (MIRA 15:10)

1. Akademiya nauk Ukrainskoy SSR (for Chekmarev).

(Rolls(Iron mills)) (Mechanical wear)

CHEKMAREV, A. P., akademik; RABINOVICH, S. N., inzh.; KAPTUROV, L. Ye., inzh.; MASHKIN, L. F., inzh.

Automatic shape adjustment of sheet mill rolls by means of a mechanical grinding device. Nauch. trudy DMI no.48:265-274 '62. (MIRA 15:10)

(Rolls(Iron mills)) (Grinding and polishing) (Electronic control)

CHEKMAREV, A.P., akademik; TAYTS, N.Yu., prof., doktor tekhn.nauk; GALATOV, N.S., inzh.; GETMANETS, V.V., inzh.; SINITSA, I.I., inzh.; MINAYEV, A.N., kand.tekhn.nauk; GUBINSKIY, V.I., inzh.; GONCHAROV, Yu.V., inzh.

Reduction of scale formation on continuous wire rod rolling mills. Stal' 22 no.4:327-330 Ap '62. (MIRA 15:5)

1. Dnepropetrovskiy metallurgicheskiy institut i Krivoroshskiy metallurgicheskiy zavod.
(Rolling (Metalwork)) (Wire--Corrosion)

CHEKMAR'EV, O. [Chekmar"ov, O.], akademik

Automatic machinery produces steel. Nauka i zhyttia 11 no.1:22-23 Ja '62. (MIRA 15:2)

1. AN USSR.

(Steel industry)
(Automation)

CHEKMAREV, A.P., akademik; TERYAYEV, V.A., kand. tekhn. nauk

Experience in the mastering and prospects for expanding the production of economical rolled shapes. Met. i gornorud. prom. no.1:24-29 Ja-F '62. (MIRA 16:6)

1. Institut chernoy metallurgii AN UkrSSR. 2. AN UkrSSR (for Chekmarev).

(Rolling(Metalwork))

CHEKMAREV, Aleksandr Petrovich, akademik; CHECHNEV, A.V., inzh., retsenzent; CHUMACHENKO, T.I., red.izd-va; BEREZOVYY, V.N., tekhn.red.

[Rolling of economical shapes] Prokatka ekonomichnykh profilei. Kiev, Gostekhizdat USSR, 1963. 267 p.
(MIRA 17:1)

1. Akademiya nauk Ukr.SSR (for Chekmarev).

S/226/63/000/002/004/014
A006/A101

AUTHORS: Chekmarev, A. P., Klimenko, P. A., Vinogradov, G. A.

TITLE: Investigating specific pressure, specific friction, and the friction coefficient in rolling metal powders

PERIODICAL: Poroshkovaya metallurgiya, no. 2, 1963, 26 - 31

TEXT: The measurements of the aforementioned parameters were carried out with the aid of three spot dynamometers with wire pickups, operating on tension. The powders were rolled in the horizontal direction on a mill, D = 208 mm, at 10.7 m/min velocity. The central dynamometer was placed in the radial direction, the two other dynamometers were placed at the ends at an angle of 45° to the central one. The readings were oscillographed. It was found that the nature of distribution of the specific pressure did not depend upon the rolled metal-powder type, and the thickness and width of strip. The magnitude of pressure varied with changing roll opening and granulation of the powder. With greater roll opening and thickness of the strip, specific pressure decreases from 3.50 t/cm^2 at a 0.75 mm thick strip of 5.8 g/cm^3 density to 1.00 t/cm^2 at 1.25

Card 1/2

and 4.2 respectively. The specific friction force τ is proportional to specific pressure $\tau = fp$ (f = the friction coefficient) in the backward and forward zones of the deformation seat; in the adhesion zone, relative metal slip along the rolls does not take place. The friction force is then not proportional to specific pressure. The specific friction force increases with reduced thickness of the strip. The friction coefficient and specific friction force are distributed non-uniformly along the grip arc. Mean value of the friction coefficient determined was f = 0.24 in rolling АПЖМ (APZhM) powder on steel rolls. Vinogradov's data, submitted in a previous article, on the decrease of specific pressure with greater thickness of the rolled powder strip, are experimentally confirmed. The increase of the strip thickness results from a higher total pressure upon the rolls. There are 6 figures and 1 table..

ASSOCIATION: Dnepropetrovskiy metallurgicheskiy institut i Institut metallokeramiki i spetsial'nykh splavov AN USSR (Dnepropetrovsk Metallurgical Institute and the Institute of Sinters and Special Alloys of AS UkrSSR)

SUBMITTED: July 4, 1962

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000308310014-1"

CHEKMAREV, A.P., akademik; SAF'YAN, M.M., inzh.; KHOLODNYY, V.P., inzh.; SOROKO, L.N., inzh.

Investigating the wear of working and backing rolls on continuous hot rolling sheet mill. Met. i gornorud. prom. no.5:23-28 S-O '63. (MIRA 16:11)

1. Dnepropetrovskiy metallurgicheskiy institut (for Chekmarev, Saf'yan, Kholodnyy). 2. Zavod "Zaporozhstal'" (for Soroko). 3. AN UkrSSR (for Chekmarev).

CHEKMAREV, A.P., akademik; VATKIN, Ya.L., doktor tekhn. nauk; KHANIN, M.I., inzh.

Determining the neutral tangential cross section of the center of deformation in diagonal rolling. Proizv. trub no.10:24-31 '63. (MIRA 17:10)

1. AN UkrSSR (for Chekmarev).

S/148/63/000/001/007/019
E193/E383

AUTHORS: Chekmarev, A.P., Smol'yaninov, A.F., Klimenko, P.L. and Lebedik, G.L.

TITLE: Roll-pressure during rolling in rolls with varying radius

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, no. 1, 1963, 78 - 88

TEXT: The investigation reported in the present paper was carried out on stand 330, equipped with rolls whose design is shown in Fig. 1 (roll with varying radius). A roll of this type comprised 4 segments with constant radii (R_{max} = 199.5 mm and R_{min} = = 184.75 mm), joined by 4 intermediate segments with varying radii, the tangent of the taper angle ($\tan\psi$) characterizing these segments being 0.1, 0.2, 0.3 and 0.4. The experiments were conducted on lead and steel specimens measuring, respectively, 43 x 40 and 45 x 40 mm. The roll-pressure was measured with the aid of dynamometers mounted in the rolls and measuring the forces normal to the roll surface. 3 dynamometers were mounted in each intermediate segment in sections I, II and III with one dynamometer mounted in the neighbouring segments with constant radii (sections IV and V); the positioning of sections I-V in and near the segment with tan ψ = 0.1 and 0.2 is shown in Fig. 2; the positioning of dynamometers in the other two segments was similar. Setting of the rolls was such that the reduction given to the rolled specimen in passing between sections of rolls with constant radii (R_{min} and R_{max}) remained constant in each series of experiments, the reduction in the segments with R_{min} being 5 mm for the lead and 6 mm for steel specimens. For comparison, the roll pressure was also determined during rolling on three stands with rolls of constant radii equal to the radii of the experimental rolls at points at which the dynamometers were mounted in segments with varying radii. Experiments on lead were conducted at room temperature and steel specimens were rolled at 1 050 °C. The results (all of which are reproduced graphically in the form of curves showing the distribution of roll-pressure in various segments of the rolls) can be summarized as follows: 1) in rolling under conditions of increasing reduction the roll pressure

Roll-pressure during rolling S/148/63/000/001/007/019
E193/E383

P increases on passing from section I to section III in each of the intermediate segments. In the case of lead, the maximum roll pressure for sections I and II, the segment with tan $\Psi = 0.1$, is 4.5 and 7.8 kg/mm^2, respectively, the corresponding figures for the segment with tan $\Psi = 0.2$ being 3.8 and 7.2 kg/mm^2. This effect is caused by the fact that on passing from section I to section II, the absolute reductin in thickness increases (from 10-29 mm in thecase of lead) and so does the deformation rate; 2) the roll pressure in section I is practically the same for all values of tan Ψ; the value of P in section II of the segment with tan $\Psi = 0.1$ is higher than in the three remaining segments. P in section III decreases with increasing tan Ψ ; 3) the conditions during rolling of lead in segments with tan $\Psi = 0.3$ and 0.4 are such that the contact angle is smaller than the friction angle. The effect of tan Ψ on P during rolling of steel is less pronounced than in the case of lead because the condition in the former case are such that the contact angle is practically equal to the friction angle; 4) the effect of tan Ψ on P is also less pronounced during rolling under conditions of decreasing reduction. In this case,

Card 3/5

Roll-pressure during rolling S/148/63/000/001/007/019
E193/E383

the pressure exerted on the rolls by lead in section I is the same for segments with tan ψ = 0.1 and 0.2; in segments with tan ψ = 0.3 and 0.4 slipping takes place in section I because the contact angle is then considerably larger than the friction angle. P in sections II and III decreases with increasing tan ψ ; 5) owing to the geometry of the intermediate segments P the repelling forces during rolling under conditions of decreasing reduction increase with increasing tan ψ ; since the tensile stresses also increase due to the fact that the contact angle exceeds the friction angle, the roll pressure under these conditions should decrease with increasing tan ψ. There are 6 figures.

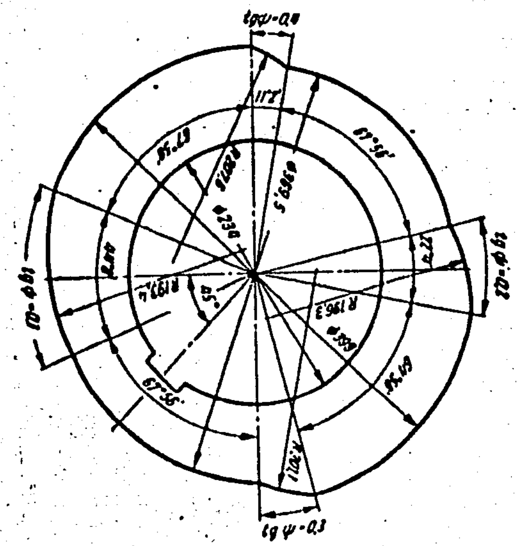
ASSOCIATION: Dnepropetrovskiy metallurgicheskiy institut (Dnepropetrovsk Metallurgical Institute)

SUBMITTED: August 10, 1961

S/148/63/000/001/007/019
E193/E383

Roll-pressure during rolling ....

Fig. 1:



Card 5/5

CHEKMAREV, A.P.; RABINOVICH, S.N.; Prinimali uchastiye: KUS'MIN, V.P.; ZVONAREV, V.K.; DEMKO, V.M.

Investigating power conditions in the rolling of lightweight shaped sections on a 550mm. medium section mill. Izv. vys. ucheb. zav.; chern. met. 6 no.4:56-67 '63. (MIRA 16:[illegible])

1. Dnepropetrovskiy metallurgicheskiy institut.
(Rolling mills)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000308310014-1"

CHEKMAREV, A.P.; SMOL'YANINOV, A.F.; LEBEDIK, G.L.

Distribution of the increase in width and length during longitudinal periodic rolling. Izv. vys. ucheb. zav.; chern. met. 6 no.5:113-117 '63. (MIRA 16:7)

1. Dnepropetrovskiy metallurgicheskiy institut.
(Rolling (Metalwork))

CHEKMAREV, A.P.; KLIMENKO, V.M.

Pressure and flow of metal in rolling with grooved rolls.
Izv. vys. ucheb. zav.; chern. met. 6 no.9:92-102 '63.
(MIRA 16:11)

1. Institut chernoy metallurgii AN UkrSSR.

CHEKMAREV, A.P.; PROKOF'YEV, V.I.; MELESHKO, V.I.; KILIYEVICH, A.F.

Theoretical basis for the measurement of specific contact forces in rolling with the help of spot dynamometers. Izv. vys. ucheb. zav.; chern. met. 7 no.10:64-69 '64.

(MIRA 17:11)

S/133/63/000/001/008/011
A054/A126

AUTHORS: Chekmarev, A. P., Saf'yan, M. M., Kholodnyy, V. G., Soroko, L. N., Ksenzuk, F. A.

TITLE: Determination of the strip temperature during rolling on continuous thin strip mills

PERIODICAL: Stal', 13 no. 1, 1963, 62 - 65

TEXT: A uniform structure of the strip with a grain size that ensures the required mechanical characteristics can only be obtained, if the end temperature of rolling is higher than A_{r_3} and the temperature of coiling is below 680°C. To determine the factors affecting the strip temperature during rolling, extensive tests were carried out at the zavod "Zaporozhstal'" ("Zaporozhstal'" Plant) on the 1,680 mm mill, covering the slab temperature from the time the product was in the heating section of the furnace onward through its passing the roughing mill (beyond the IV stand of this group), before the V finishing stand and beyond the X stand, by means of photoelectric pyrometers and also with a portable radiation tube at various spots between the stands of the finishing

Card 1/3

Determination of the strip temperature... S/133/63/000/001/008/011
A054/A126

group. The effects of the heat absorbed by the slab during heating, the cooling time, the cooling methods, the strip surface-to-volume ratio, the chemical composition of the steel, the strip thickness and the rolling rate on the strip temperature were studied. In the tests, stainless [1Х18Н9Т (1Kh18N9T)] and carbon [Ст.3кп (St.3kp)] grades were rolled to sizes varying between 3 x 1,030 and 6 x 1,232 mm. The temperature changes on the finishing stands, the effect of the rolling rate on the X stand and of strip thickness on the end temperature are shown in 8 graphs. At equal temperatures, strip thicknesses and rolling conditions, the end temperature of rolling for stainless steel strips is about 50 - 60°C higher than for carbon steel strips of the same dimensions. Increasing the rolling rate on the X stand by 10 m/min raises the end temperature of rolling for carbon steels by 2 - 3°C and for stainless steels by 5 - 6°C. By reference to the test results on the finishing stands and known equations used in temperature calculations the following empirical formulae were drawn up:

$$t = 815 + \frac{228(h-2)}{(h-2) + 2.57} \quad (3)$$ for carbon steels and

$$t = 920 + \frac{71(h-3)}{(h-3) + 0.76} \quad (4)$$ for stainless steels,

Card 2/3

(where h = the thickness of the strip beyond the stand in question, in mm). The formulae can be used for rolling conditions similar to those on the 1,680 mm mill. The graphs show a satisfactory similarity of the test results and the data obtained by the above formulae. There are 3 sets of graphs and 2 tables.

S/032/63/029/002/017/028
B101/B186

AUTHORS: Chekmarev, A. P., and Kachaylov, A. P.

TITLE: Determination of the resistance of steel to torsional deformation at different temperatures and deformation rates

PERIODICAL: Zavodskaya laboratoriya, v. 29, no. 2, 1963, 213 - 215

TEXT: The torsional testing of steel tubes is described, these having an external diameter 24 - 26 mm, internal diameter 17 mm and being made by turning in a lathe at 900 - 1200°C, deformation rate 14 - 253 sec^{-1}. The torque was measured with wire strain gauges. Torque, torsion angle and number of revolutions of the spindle were recorded with a Siemens galvanometer oscillograph. The dependence $\tau = f_1(\gamma)$ where $\gamma = a\varphi/l$, φ-torsion angle, l length of specimen, was obtained from the torque versus torsion angle curve from the equation $\tau = M_t/2\pi a^2 h$, where τ-resistance to deformation, M_t-torque, a-radius of the specimen, h-thickness of the wall. With the aid of the relations $\tau = \sigma/\sqrt{3}$, $\gamma = 2\varepsilon$, $\gamma = 2u$ the $\sigma = f(u)$ curves can be determined for different degrees of deformation and different tempera-

Card 1/2

tures, σ is the resistance to deformation, ε is the degree of deformation, %, u is the rate of deformation, sec^{-1}. The relation $\gamma = 2\varepsilon$ is valid to $\gamma \leqslant 60\%$. Tests with P18 (R18) steel gave good agreement with published data among them those of P. M. Cook, A. W. McCrum (The calculation of load and torque in hot flat rolling, BISKA, March (1958)).

ASSOCIATION: Dnepropetrovskiy institut chernoy metallurgii (Dnepropetrovsk Institute of Ferrous Metallurgy)

CHEKMAREV, A.P.; KLIMENKO, P.A.; VINOGRADOV, G.A.

Pressure and the friction coefficient in rolling metal powders.
Trudy LPI no.222:53-57 '63. (MIRA 16:7)
(Rolling (Metalwork)) (Powder metallurgy)

CHEKMAREV, A.P., adadomik; GRUDEV, A.P., kand. tekh.nauk; TARAN, Yu.N., kand. tekhn.nauk; ZIL'BERG, Yu.V., inzh.; KURILENKO, V.Kh., inzh.; DERGACH, A.Ya., inzh.; LITINSKIY, D.M., inzh.; NESTEROVA, G.V., inzh. SAMOYLENKO, V.D., inzh.

Reducing metal sticking on the rolls during the hot rolling of stainless tubes. Stal' 23 no.7:631-635 Jl '63. (MIRA 16:9)

1. AN UkrSSR (for Chekmarev).
(Pipe mills) (Steel, Stainless)

CHEKMAREV, Aleksandr Petrovich; CHERNOBRIVENKO, Yuriy Sergeyevich

[Roller guide equipment of rolling mills] Rolikovaia armatura prokatnykh stanov. Moskva, Izd-vo "Metallurgiia," 1964. 255 p. (MIRA 17:6)

CHEKMAREV, A.P., akademik; MASHKOVTSEV, R.A., kand.tekhn.nauk; SHLOMCHAK, G.G.

Power parameters in rolling lightweight sections. Met. i gornorud. prom. no. 2:33-34 Mr-Ap '64. (MIRA 17:9)

1. Akademiya nauk Ukrainskoy SSR (for Chekmarev).

CHEKMAREV, A.P., akademik; VATKIN, Ya.L., doktor tekhn. nauk; KHANIN, M.I.; KUSHCHINSKIY, G.N.

Accelerating the piercing process on inclined roll mills using axial support of the blank. Met. i gornorud. prom. no.5:34-36 S-O '64. (MIRA 18:7)

1. Akademiya nauk Ukrainskoy SSR (for Chekmarev).

L 19840-65 EWT(m)/EWA(d)/EWP(t)/EWP(k)/EWP(b) Pf-4 MJW/JD/HW

ACCESSION NR: AP4049064 S/0148/64/000/011/0112/0119

AUTHOR: Chekmarev, A. P.; Saf'yan, M. M.; Kholodny*y V. P.; Ksenzyuk, F. A.

TITLE: Variations in longitudinal thickness during hot rolling of metal strips on continuous sheet mills /6

SOURCE: IVUZ. Chernaya metallurgiya, no. 11, 1964, 112-119

B

TOPIC TAGS: hot rolling, continuous sheet mill, longitudinal thickness, metal strip rolling

ABSTRACT: Variations in longitudinal thickness of hot-milled strips are due either to variation in temperature along the strip or to variation in pressure between the stands caused by roller wobbling, the ends of the strips being thicker than the middle. Experiments on the thickness of strips were performed on a continuous sheet mill at the Zaporozhstal' factory, with an oscillograph placed on the tenth stand set to show the change in thickness of the strip. Oscillograms showed that in every case the ends were thicker than the centers, and the trailing edge was thicker than the leading edge. 1Kh18N9T steel showed a greater variation in thickness than carbon steels. The difference in temperature from the front to the rear can be reduced by a reduction in size of the strip of metal. Experiments

Card 1/2

L 19840-65

ACCESSION NR: AP4049064

showed that increasing the rate of revolution of the tenth stand rollers by 15% and correspondingly increasing the rate of feed reduced the thickness by 11% and the area by 17.5%. In general, experiments confirmed theoretical predictions within reasonable limits. Orig. art. has: 3 graphs, 3 tables, and 6 formulas.

ASSOCIATION: Dnepropetrovskiy metallurgicheskiy institut (Dnepropetrovsk Metallurgical Institute)

SUBMITTED: 07Jul62 ENCL: 00 SUB CODE: MM

NO REF SOV: 006 OTHER: 001

Cord 2/2

L 33931-65 EPF(c)/EWP(k)/EWA(c)/EWT(m)/EWP(b)/T/EWA(d)/EWP(t) Pf-4/
Pr-4 DJ/HW/JD

ACCESSION NR: AP4049066 S/0148/64/000/011/0131/0136

AUTHOR: Chekmarev, A. P.; Grudev, A. P.; Zil'berg, Yu. V. 35 30

TITLE: Use of lubricants in hot rolling of steel 14 B

SOURCE: IVUZ. Chernaya metallurgiya, no. 11, 1964, 131-136

TOPIC TAGS: rolling lubricant, hot rolling, steel rolling, glass lubricant, salt, graphite

ABSTRACT: Investigations were carried out to determine the possibility of using lubricants in the production of thin-walled light-weight sections. The lubricants were required to reduce external friction significantly, not liberate smoke, soot, etc., not have a deleterious effect on the equipment and rolled metal, be easily removed from the surface of the finished rolled product or be retained as an intact, strong film, and be cheap and readily available. All lubricants were used in powder form. The lubricants used were: window glass, a mixture of window glass and silver graphite (1:1 by volume), No. 6 glass, and common salt. The experiments were carried out on a laboratory mill with 205.6-206.6 mm diam. rolls. The rolls were chilled cast iron; barrel hardness was Shore 65; rolling speed was 0.3 m/sec. The specimens were heated in a furnace at 30-50C above the rolling temperature. After heating, the specimens were removed from the

Card 1/2

L 33931-65
ACCESSION NR: AP4049066

3

furnace, descaled, immersed in the powdered lubricant, returned to the furnace and held 5-10 min. before rolling. The factors investigated were: general characteristics of lubricant behavior, spreading, forward creep, rolling pressure, and maximal angle of contact. It was found that in hot rolling of steel it is advantageous to use lubricants in the finishing passes to reduce external friction and roll wear. The investigations are to continue in order to determine efficient compositions of lubricants and to develop a device for supplying the lubricant to the metal being rolled. "P. L. Klimenko determined the specific rolling pressures." Orig. art. has: 4 tables, 1 figure, and 2 formulas.

ASSOCIATION: Dnepropetrovskiy metallurgicheskiy institut (Dnepropetrovsk metallurgical institute)

SUBMITTED: 31Jul62 ENCL: 00 SUB CODE: FP, MM, IE

NO REF SOV: 007 OTHER: 002

Card 2/2

CHEKMAREV, A.P.; TOPOROVSKIY, M.P.

Investigating transition processes in continuous rolling.
Izv. vys. ucheb. zav.; chern. met. 7 no.1:78-88 '64.
(MIRA 17:2)

1. Institut chernoy metallurgii.